IN THE CLAIMS

1. (Previously Presented) A method for determining the endpoint of an etch process, comprising:

(a) providing a substrate comprising a material layer having an initial thickness, wherein the material layer is a high-k dielectric material layer;

(b) etching the material layer on the substrate;

(c) directing radiation onto the substrate as the material layer is etched, wherein the radiation has a wavelength in nanometers that is on the order of the initial thickness of the material layer in Angstroms;

(d) measuring a change in intensity for radiation reflected from the substrate at a pre-selected wavelength as the material layer is etched; and

(e) terminating the etch step upon measuring a predetermined metric for the change in intensity of radiation reflected from the substrate at the pre-selected wavelength.

2. (Original) The method of claim 1 wherein the radiation has a wavelength within a range from about 200 to 800 nm onto the substrate.

3. (Original) The method of claim 1 wherein the thickness of the material layer is 5 to 300 Angstroms.

4. (Original) The method of claim 1 wherein the thickness of the material layer is less than or equal to the wavelength of the radiation.

5. (Original) The method of claim 1 wherein step (c) comprises:
directing the radiation substantially perpendicular to the material layer; and
modulating the intensity of the directed radiation.

6. (Original) The method of claim 1 wherein step (d) comprises:
filtering wavelengths other than the pre-selected wavelength.

7. (Original) The method of claim 1 wherein the predetermined metric is associated with measuring a predetermined change in intensity for the reflected radiation at the pre-selected wavelength.

8. (Original) The method of claim 1 wherein the predetermined metric is associated with measuring a substantially constant intensity for the reflected radiation as a function of time at the pre-selected wavelength.

9. (Original) The method of claim 7 wherein measuring the predetermined change of intensity for the reflected radiation is associated with removal of the material layer from the substrate.

10. (Original) The method of claim 8 wherein measuring the substantially constant intensity for the reflected radiation as a function of time is associated with removal of the material layer from the substrate.

11. (Previously Presented) A method for determining the endpoint for etching a gate dielectric layer of a transistor, comprising:

(a) providing a substrate comprising a gate dielectric layer having an initial thickness, wherein the gate dielectric layer is a high-k gate dielectric layer;

(b) etching the gate dielectric layer on the substrate;

(c) directing radiation onto the substrate as the gate dielectric layer is etched, wherein the radiation has a wavelength in nanometers that is on the order of the initial thickness of the gate dielectric layer in Angstroms;

(d) measuring a change in intensity for radiation reflected from the substrate at a pre-selected wavelength as the gate dielectric layer is etched; and

(e) terminating the etch step upon measuring a predetermined metric for the change in intensity of radiation reflected from the substrate at the pre-selected wavelength.

12. (Original) The method of claim 11 wherein the thickness of the gate dielectric layer is less than or equal to the wavelength of the radiation.

13. (Original) The method of claim 11 wherein the gate dielectric layer comprises at least one film of hafnium dioxide (HfO_2) and hafnium silicate ($HfSiO_2$).

14. (Original) The method of claim 11 wherein the thickness of the gate dielectric layer is about 5 to 300 Angstroms.

15. (Original) The method of claim 11 wherein step (c) comprises:

directing radiation having wavelengths within a range from about 200 to 800 nm onto the substrate.

16. (Original) The method of claim 11 wherein step (c) comprises:

directing the radiation substantially perpendicular to the gate dielectric layer; and

modulating the intensity of the directed radiation.

17. (Original) The method of claim 11 wherein step (d) comprises:

filtering wavelengths other than the pre-selected wavelength.

18. (Original) The method of claim 11 wherein the predetermined metric is associated with measuring a predetermined change in intensity for the reflected radiation at the pre-selected wavelength.

19. (Original) The method of claim 11 wherein the predetermined metric is associated with measuring a substantially constant intensity for the reflected radiation as a function of time at the pre-selected wavelength.

20. (Original) The method of claim 18 wherein measuring the predetermined change of intensity for the reflected radiation is associated with removal of the gate dielectric layer from the substrate.

21. (Original) The method of claim 20 wherein measuring the substantially constant intensity for the reflected radiation as a function of time is associated with removal of the gate dielectric layer from the substrate.

22-31. (Cancelled)

32. (Withdrawn – Previously Presented) A computer-readable medium containing software that, when executed by a computer, causes a processing system to detect an endpoint of an etch process using a method, comprising:

(a) providing a substrate comprising a material layer having an initial thickness, wherein the material layer is a high-k dielectric material layer;

(b) etching the material layer on the substrate;

(c) directing radiation onto the substrate as the material layer is etched, wherein the radiation has a wavelength in nanometers that is on the order of the initial thickness of the material layer in Angstroms;

(d) measuring a change in intensity for radiation reflected from the substrate at a pre-selected wavelength as the material layer is etched; and

(e) terminating the etch step upon measuring a predetermined metric for the change in intensity of radiation reflected from the substrate at the pre-selected wavelength.

33. (Withdrawn) The computer-readable medium of claim 32 wherein step (c) comprises:

directing radiation having wavelengths within a range from about 200 to 800 nm onto the substrate.

34. (Withdrawn) The computer-readable medium of claim 32 wherein the thickness of the material layer is 5 to 300 Angstroms.

35. (Withdrawn) The computer-readable medium of claim 32 wherein the thickness of the material layer is less than or equal to the wavelength of the radiation.

36. (Withdrawn) The computer-readable medium of claim 32 wherein step (c) comprises:

directing the radiation substantially perpendicular to the material layer; and

modulating the intensity of the directed radiation.

37. (Withdrawn) The computer-readable medium of claim 32 wherein step (d) comprises:

filtering wavelengths other than the pre-selected wavelength.

38. (Withdrawn) The computer-readable medium of claim 32 wherein the predetermined metric is associated with measuring a predetermined change in intensity for the reflected radiation at the pre-selected wavelength.

39. (Withdrawn) The computer-readable medium of claim 32 wherein the predetermined metric is associated with measuring a substantially constant intensity for the reflected radiation as a function of time at the pre-selected wavelength.

40. (Withdrawn) The computer-readable medium of claim 38 wherein measuring the predetermined change of intensity for the reflected radiation is associated with removal of the material layer from the substrate.

41. (Withdrawn) The computer-readable medium of claim 39 wherein measuring the substantially constant intensity for the reflected radiation as a function of time is associated with removal of the material layer from the substrate.

42. (Previously Presented) The method of claim 1 wherein the thickness of the material layer is 20 to 100 Angstroms.

43. (Previously Presented) The method of claim 11 wherein the thickness of the gate dielectric layer is 20 to 100 Angstroms.

44. (Previously Presented) A method for determining the endpoint of an etch process, comprising:

(a) providing a substrate comprising a material layer having an initial thickness, wherein the material layer is a high-k dielectric material layer;

(b) etching the material layer on the substrate;

(c) directing radiation onto the substrate as the material layer is etched, wherein the radiation has a wavelength of between about 200 to about 800 nanometers and wherein the thickness of the material layer is between about 5 to about 300 Angstroms;

(d) measuring a change in intensity for radiation reflected from the substrate at a pre-selected wavelength as the material layer is etched; and

(e) terminating the etch step upon measuring a predetermined metric for the change in intensity of radiation reflected from the substrate at the pre-selected wavelength.

45. (Previously Presented) The method of claim 44, wherein the thickness of the material layer is less than or equal to the wavelength of the radiation.

46. (Previously Presented) The method of claim 44, wherein step (c) comprises:
directing the radiation substantially perpendicular to the material layer; and
modulating the intensity of the directed radiation.

47. (Previously Presented) The method of claim 44, wherein step (d) comprises:
filtering wavelengths other than the pre-selected wavelength.

48. (Previously Presented) The method of claim 44, wherein the predetermined metric is associated with measuring a predetermined change in intensity for the reflected radiation at the pre-selected wavelength.

49. (Previously Presented) The method of claim 48, wherein measuring the predetermined change of intensity for the reflected radiation is associated with removal of the material layer from the substrate.

50. (Previously Presented) The method of claim 44, wherein the predetermined metric is associated with measuring a substantially constant intensity for the reflected radiation as a function of time at the pre-selected wavelength.

51. (Previously Presented) The method of claim 50, wherein measuring the substantially constant intensity for the reflected radiation as a function of time is associated with removal of the material layer from the substrate.